## CLAIMS

- 1. A programmable gain voltage buffer comprising:
- a gain stage; and

a programmable resistance in communication with the gain stage, the programmable resistance including a switch in parallel with a resistive element.

2. The voltage buffer of claim 1, further comprising:

an output node coupled between the gain stage and the programmable resistance,

wherein the switch is operable to change a gain at the output node.

- 3. The voltage buffer of claim 2, wherein the gain at the output node has a first gain value when the switch is activated and a second gain value when the switch is deactivated.
- 4. The voltage buffer of claim 2, wherein the gain is proportional to an equivalent resistance at the output node.

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- 5. The voltage buffer of claim 2, wherein the switch is operable to change the gain in response to being activated and deactivated.
- 6. The voltage buffer of claim 1, wherein the switch provides a first resistance value in parallel with the resistive element when activated and is effectively removed from the circuit when deactivated.
- 7. The voltage buffer of claim 6, wherein the first resistance value comprises a source-drain resistance of the switch.
- 8. The voltage buffer of claim 6, wherein the first resistance value of the switch corresponds to a programmable gain step for the circuit.
- 9. The voltage buffer of claim 1, wherein the voltage buffer comprises a differential voltage buffer including two branches, each branch including
  - a gain stage, and

a programmable resistance in communication with the gain stage, the programmable resistance including a switch in parallel with a resistive element

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- 10. The voltage buffer of claim 9, wherein the switches in the two branches are operative to be activated and deactivated substantially simultaneously.
- 11. The voltage buffer of claim 2, wherein the programmable resistance further comprises:

a second switch in parallel with said switch and the resistive element, the second switch operative to change the gain in response to being activated and deactivated.

- 12. The voltage buffer of claim 1, further comprising a second circuit operative to control an accuracy of the gain.
- 13. The voltage buffer of claim 12, wherein the second circuit comprises:
  - a reference resistive element;

a tunable resistive element in parallel with the reference resistive element, the tunable resistive element operative to track a resistance of the reference resistive element and having a gate with a bias voltage; and

an output line coupled to the gate of the tunable resistive element and a gate of each of the switches.

Customer No. 23624 14 Express Mail Label No. EV 348186877 US 14. A method comprising:

applying an input signal to a voltage buffer;

activating one or more selected switches in parallel

with a predominant resistive element in the voltage buffer;

and

changing a gain of the buffer by at least a programmable gain step.

- 15. The method of claim 14, wherein said changing the gain comprises changing an equivalent resistance at an output point in the voltage buffer.
  - 16. The method of claim 14, further comprising:

deactivating one or more of said selected switches in parallel with the predominant resistive element in the voltage buffer; and

changing a gain of the buffer by at least a programmable gain step.

17. The method of claim 14, wherein said applying the input signal comprises receiving a signal from a first circuit.

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- 18. The method of claim 17, further comprising: providing an output signal to a second circuit.
- 19. The method of claim 18, wherein the first circuit comprises a reference voltage circuit.
- 20. The method of claim 19, wherein the second circuit comprises a load circuit.
  - 21. A device comprising:
  - a first circuit operative to provide a voltage signal;
  - a second circuit;
- a voltage buffer coupled between the first and second circuits and operative to provide a programmable gain to the voltage signal, the voltage buffer comprising:
  - a gain stage; and
- a programmable resistance in communication with the gain stage, the programmable resistance including a switch in parallel with a resistive element.
  - 22. The device of claim 21, further comprising:

an output node coupled between the gain stage and the programmable resistance,

wherein the switch is operable to change a gain at the output node.

- 23. The device of claim 22, wherein the gain at the output node has a first gain value when the switch is activated and a second gain value when the switch is deactivated.
- 24. The device of claim 22, wherein the gain is proportional to an equivalent resistance at the output node.
- 25. The device of claim 22, wherein the switch is operable to change the gain in response to being activated and deactivated.
- 26. The device of claim 21, wherein the switch provides a first resistance value in parallel with the resistive element when activated and is effectively removed from the circuit when deactivated.
- 27. The device of claim 26, wherein the first resistance value comprises a source-drain resistance of the switch.

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- 28. The device of claim 26, wherein the first resistance value of the switch corresponds to a programmable gain step for the circuit.
- 29. The device of claim 21, wherein the comprises a differential voltage buffer including two branches, each branch including
  - a gain stage, and
- a programmable resistance in communication with the gain stage, the programmable resistance including a switch in parallel with a resistive element
- 30. The device of claim 29, wherein the switches in the two branches are operative to be activated and deactivated substantially simultaneously.
- 31. The device of claim 22, wherein the programmable resistance further comprises:

a second switch in parallel with said switch and the resistive element, the second transistor operative to change the gain in response to being activated and deactivated.

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- 32. The device of claim 21, further comprising a second circuit operative to control an accuracy of the gain.
- 33. The device of claim 32, wherein the second circuit comprises:
  - a reference resistive element;
- a tunable resistive element in parallel with the reference resistive element, the tunable resistive element operative to track a resistance of the reference resistive element and having a gate with a bias voltage; and

an output line coupled to the gate of the tunable resistive element and a gate of each of the switch.

34. A programmable gain voltage buffer comprising: a gain stage; and

means for providing a programmable resistance in communication with the gain stage, the programmable resistance including switching means in parallel with resistive means.

35. The voltage buffer of claim 34, further comprising:

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an output node coupled between the gain stage and the programmable resistance,

wherein the switching means includes means for changing a gain at the output node.

- 36. The voltage buffer of claim 35, wherein the gain at the output node has a first gain value when the switching means is activated and a second gain value when the switching means is deactivated.
- 37. The voltage buffer of claim 35, wherein the gain is proportional to an equivalent resistance at the output node.
- 38. The voltage buffer of claim 35, wherein the switching means is operable to change the gain in response to being activated and deactivated.
- 39. The voltage buffer of claim 34, wherein the switching means provides a first resistance value in parallel with the resistive means when activated and is effectively removed from the circuit when deactivated.

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- 40. The voltage buffer of claim 39, wherein the first resistance value comprises a source-drain resistance of a switch.
- 41. The voltage buffer of claim 39, wherein the first resistance value of the switching means corresponds to a programmable gain step for the circuit.
- 42. The voltage buffer of claim 34, wherein the voltage buffer comprises a differential voltage buffer including two branches, each branch including

a gain stage, and

means for providing a programmable resistance in communication with the gain stage, the programmable resistance including switching means in parallel with resistive means

- 43. The voltage buffer of claim 42, wherein the switching means in the two branches are operative to be activated and deactivated substantially simultaneously.
- 44. The voltage buffer of claim 35, wherein the programmable resistance further comprises:

Customer No. 23624 21 Express Mail Label No. EV 348186877 US a second switching means in parallel with said switching means and the resistive means, the second switching means including means for changing the gain in response to being activated and deactivated.

- 45. The voltage buffer of claim 34, further comprising a second circuit including means for controlling an accuracy of the gain.
- 46. The voltage buffer of claim 45, wherein the second circuit comprises:

means for providing a reference resistance;

means for providing a tunable resistance in parallel with the means for providing the reference resistance, the means for providing the tunable resistance including means for tracking a resistance of the reference resistive means and having a gate with a bias voltage; and

an output line coupled to said gate and a gate of each of the switching means.